

1971

OPERATING
SUMMARY

LIBRARY COPY

AUG 1 1974

MINISTRY OF THE
ENVIRONMENT

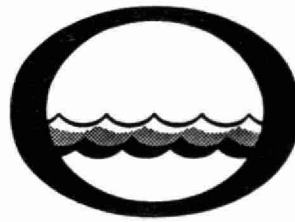
TD227
H86
W38
1971
MOE

c.1
a aa

LABORATORY LIBRARY
MINISTRY OF THE ENVIRONMENT

HUNTSVILLE

WATER POLLUTION CONTROL PLANT

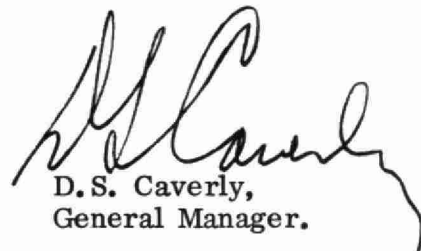


Water management in Ontario


Ontario
Water Resources
Commission

We are pleased to submit for your consideration a summary of operation during 1971 of the water pollution control plant serving your community.

This operating summary contains parameters normally used to measure plant performance and loading, as well as relevant cost data. Because of the concern over eutrophication of our lakes and of the requirement, in many parts of Ontario, to remove the major contributing factor, results of analysis for phosphorus appear in **this** summary.



D.S. Caverly,
General Manager.



D.A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

TD
227
H86
W38
1971
MOE

atfd



Environment Ontario
Laboratory Library
125 Resources Rd.
Etobicoke, Ontario M9P 3V6
Canada

ONTARIO WATER RESOURCES COMMISSION

CHAIRMAN
R. D. Johnston

VICE-CHAIRMAN
J. H. H. Root, M. P. P.

COMMISSIONERS
H. E. Brown
F. S. Hollingsworth
Dr. C. A. Martin
D. A. Moodie
L. E. Venchiarutti

GENERAL MANAGER
D. S. Caverly

ASSISTANT GENERAL MANAGERS
R. K. L. Sachse
K. H. Sharpe
F. A. Voegel
A. K. Watt

COMMISSION SECRETARY
W. S. MacDonnell

DIVISION OF PLANT OPERATIONS

Director
D. A. McTavish

Assistant Director
C. W. Perry

Regional Supervisor
P. J. Osmond

Operations Engineer
A. Clark

135 St. Clair Avenue West
Toronto 195

HUNTSVILLE WATER POLLUTION CONTROL PLANT

operated for

THE TOWN OF HUNTSVILLE

by the

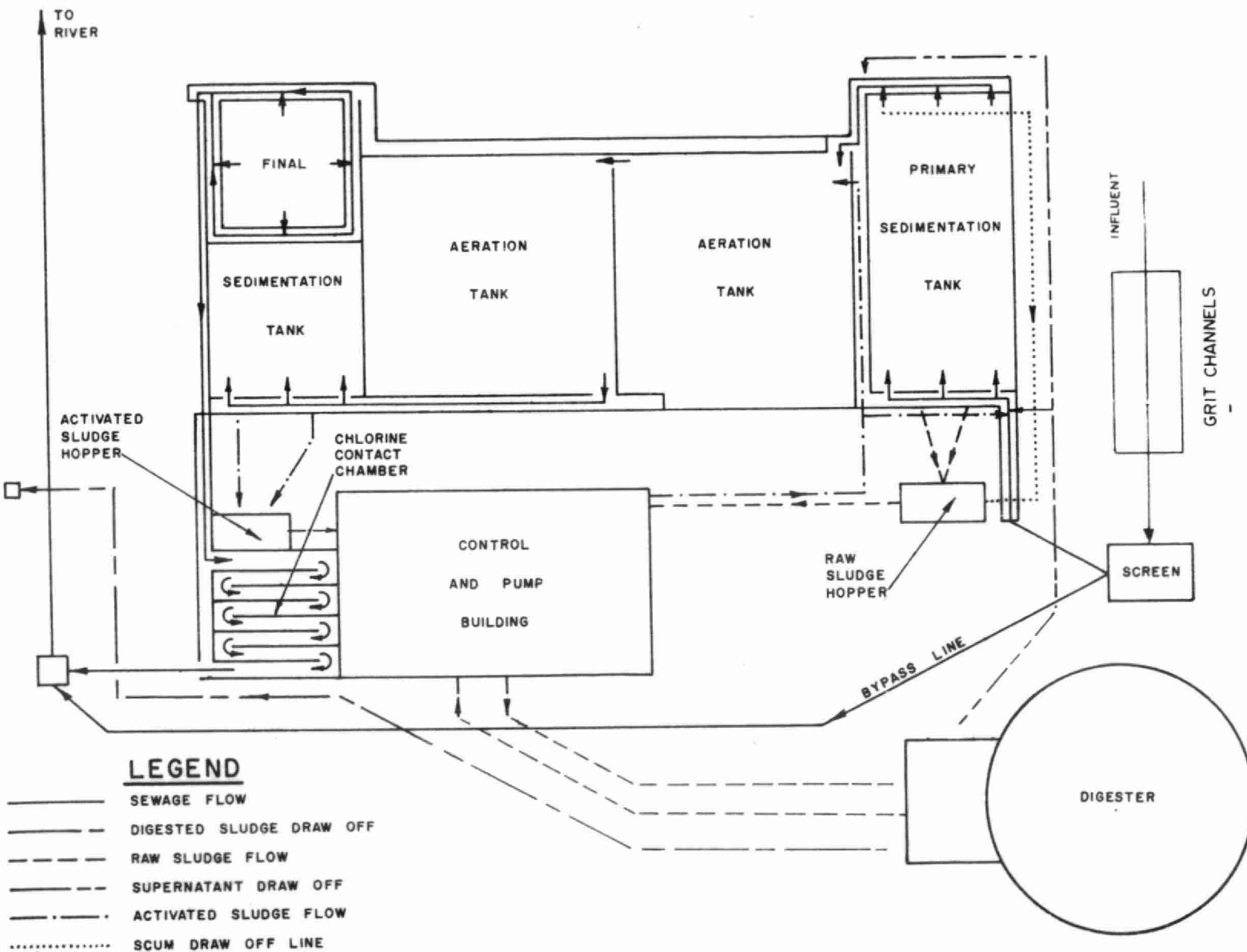
ONTARIO WATER RESOURCES COMMISSION

1971 ANNUAL OPERATING SUMMARY

CONTENTS

Title Page	. . . . .	1
Flow Diagram	. . . . .	4
Design Data	. . . . .	5
'71 Review	. . . . .	6
Project Costs	. . . . .	8
Process Data	. . . . .	11

HUNTSVILLE WATER POLLUTION CONTROL PLANT



DESIGN DATA

PROJECT NO. 2-0015-58

TREATMENT Activated Sludge

DESIGN FLOW 0.25 mgd

DESIGN POPULATION 3,000

BOD - Raw Sewage 250 mg/l
- Removal 90-95%

SS - Raw Sewage 250 mg/l
- Removal 90-95%

PRIMARY TREATMENT

Grit Removal

Type: Manually cleaned channels
Size: Two 10' x 1'7" x 3'4"
(2 x 52½ cu ft)
Velocity: 0.99 fps

Screening

Type: Manually cleaned bar screen

Primary Sedimentation

Type: United Steel Corp.
Size: One 30' x 10' x 8' (15,000 gal)
Retention: 1.5 hr
Loading: Surface, 833 gal/ft²/day
Weir, 25,000 gal/ft/day

SECONDARY TREATMENT

Aeration Tanks

Type: Mechanical aeration
Size: Two 24' x 24' x 12' (87,500 gal)
Retention: 8.4 hr

Aerators: Chicago Pump (2)

Secondary Sedimentation

Type: United Steel Corp.
Size: One 30' x 13' x 12' (29,300 gal)
Retention: 2.8 hr
Loading: Surface, 640 gal/ft²/day
1 Weir, 5,300 gal/ft/day

CHLORINATION

Type: W & T
Size: One 20 lb/day

Chlorine Contact Chamber

Size: One 12' x 11½' x 10' swd
(6,250 gal)
Retention: 36 min

OUTFALL

- 105' of 15" corrugated pipe to
Muskoka River

SLUDGE HANDLING

Digestion System - Single-stage

Type: Mixed by recirculation, Fairbanks-
Morse, 100 gpm @ 40' tdh
Size: One 30' dia x 20' swd (15,000 cu ft
or 93,500 gal)
Loading: 1.2 lb/cu ft/mo

PUMPING STATIONS

Pumping Station #1

Type: Chicago Pump
Size: Two 290 gpm

Pumping Station #2

Type: Chicago Pump
Size: Two 80 gpm

Pumping Station #3

Type: Chicago Pump
Size: One 80 gpm

'71 Review

GENERAL

The project consists of a 250,000 gallon per day secondary treatment plant and three pumping stations, as well as two Town-owned pumping stations. The plant was operated by a chief operator, assisted by a town employee whose salary is not included in the operating costs. The staff carried out regular inspections and maintenance of the pumping stations and sewer systems. The plant operated considerably above its design hydraulic capacity most of the time.

The firm of R. V. Anderson Associates Limited completed a study regarding the future sewage requirements of the Town and proposed that the plant be enlarged to 1.0 million gallons per day capacity.

EXPENDITURES

The total operating cost for the year was \$19,261.64 compared to \$19,268.31 in 1970. The unit cost per million gallons treated was \$142.47 compared to \$156.50 in 1970.

PLANT FLOWS and CHLORINATION

A total of 135.2 million gallons was recorded as being treated during the year. The average daily flow for the year was 370,000 gallons per day compared to 340,000 gallons in 1970. There was a considerable amount of surface water being treated.

A total of 4,530 pounds of chlorine was used during the year to disinfect the final effluent at an average dosage of 3.4 mg/l.

PLANT EFFICIENCY

The raw sewage had an average strength of 135 mg/l BOD and 123 mg/l suspended solids. The BOD strength was similar to 1970 but the average suspended solids concentration was reduced considerably from 201 mg/l in 1970.

The final effluent had an average concentration of 10 mg/l BOD, unchanged from 1970 and 17 mg/l suspended solids, up from the 15 mg/l average during 1970. The OWRC objective of 15 mg/l BOD and suspended solids was met approximately 80 percent of the time for BOD but only 45 percent of the time for suspended solids. The average reduction in BOD was 93 percent and in suspended solids 86 percent.

An estimated 430 cubic feet of grit was removed, representing an average of 3.2 cubic feet removed per million gallons treated in 1970. This value is still above normal and is a further indication of surface water entering the system.

SLUDGE DISPOSAL

An estimated 399,000 gallons of raw sludge was pumped to the digester. A total of 337,000 gallons of digested sludge was removed by tank truck.

CONCLUSIONS and RECOMMENDATIONS

The plant is operating considerably above its hydraulic design load, but is treating a weak sewage as a result of dilution by surface water. The average final effluent is within the OWRC objective for BOD and slightly above the OWRC objective for suspended solids.

The program of storm water separation should be continued. The recommendations of R. V. Anderson's report should be reviewed and implemented.

PROJECT COSTS

NET CAPITAL COST (Final)	\$452, 388. 75
DEDUCT - Portion financed by CMHC/MDLB (Final)	<u>-</u>
Long Term Debt to OWRC	<u>\$452, 388. 75</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1971	<u>\$ 49, 974. 73</u>
Net Operating	\$ 19, 261. 64
Debt Retirement	15, 200. 00
Reserve	-
Interest Charged	<u>25, 374. 86</u>
TOTAL	<u>\$ 59, 836. 50</u>

RESERVE ACCOUNT

Balance @ January 1, 1971	\$ 31, 400. 80
Deposited by Municipality	-
Interest Earned	<u>2, 058. 67</u>
	\$ 33, 459. 47
Less Expenditures	<u>1, 767. 15</u>
Balance @ December 31, 1971	<u>\$ 31, 692. 32</u>

1971 COSTS

OPERATING COSTS

PAYROLL	48 %
FUEL	3 %
POWER	13 %
CHEMICALS	3 %
GENERAL SUPPLIES	5 %
EQUIPMENT	1 %
REPAIRS & MAINTENANCE	2 %
SUNDRY	23 %
WATER	< 1 %
TRAVEL	< 1 %

TOTAL ANNUAL COST

NET OPERATING	33 %
DEBT RETIREMENT	25 %
RESERVE	0 %
INTEREST	42 %

YEARLY OPERATING COSTS

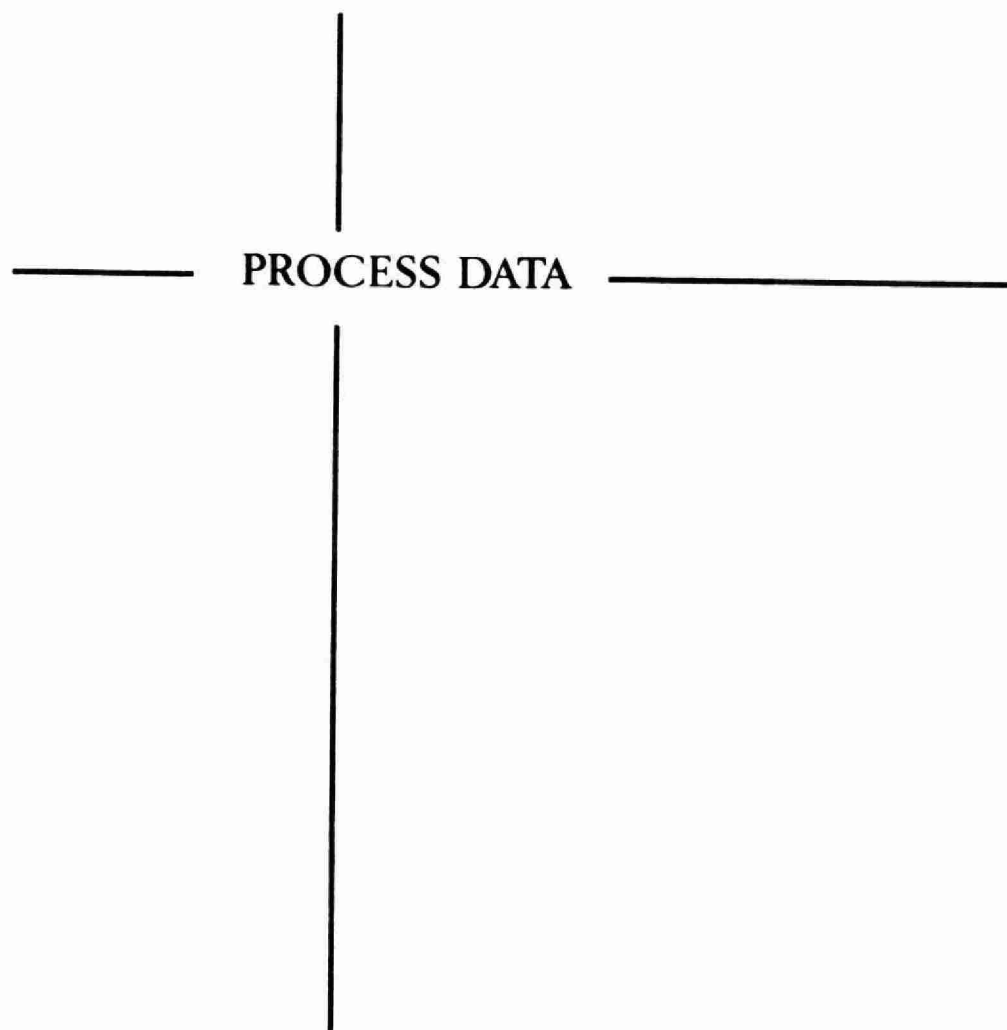
YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	TREATMENT COSTS	
			\$ per million gal	¢ per lb BOD
1967	83.95	\$10,947.58	\$130.40	11 cents
1968	96.72	13,293.28	137.44	10 cents
1969	103.90	14,146.12	136.15	10 cents
1970	123.1	19,268.31	156.50	12 cents
1971	135.2	19,261.64	142.50	12 cents

MONTHLY OPERATING COSTS

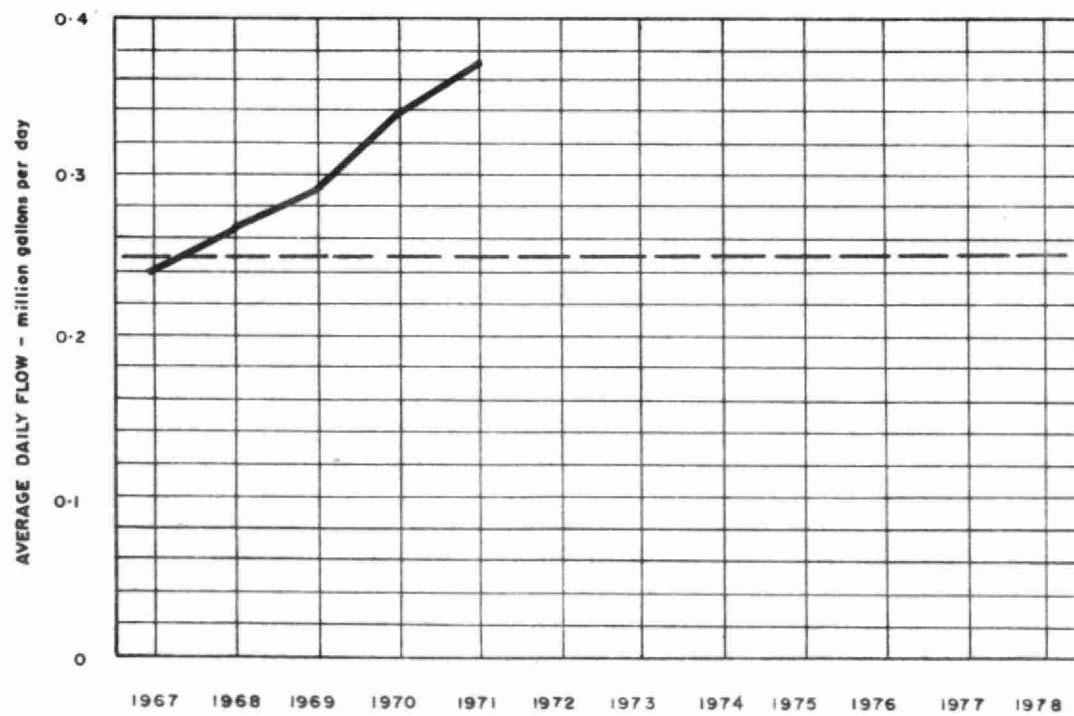
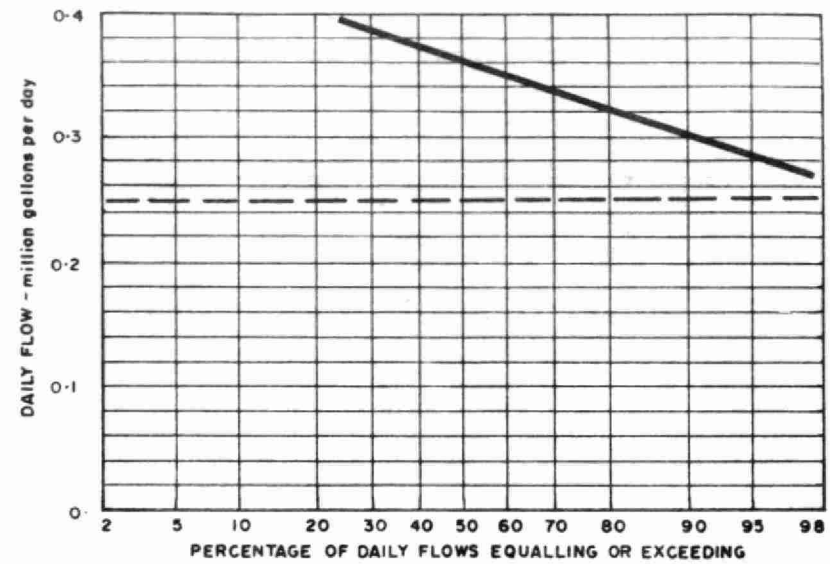
MONTH	TOTAL EXPENDITURE	REGULAR PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY*	WATER	TRAVEL
JAN	662.85	587.80	-	64.20	-	-	10.85	-	-	-	-	-
FEB	1516.54	861.83	-	32.30	472.90	-	87.48	-	9.12	44.41	8.50	-
MAR	980.42	588.65	-	45.30	63.50	-	29.25	-	-	253.72	-	-
APR	541.91	639.01	-	57.54	422.69	-	104.18	-	(823.20)	134.49	7.20	-
MAY	994.04	590.88	51.67	-	62.82	174.35	50.73	-	51.35	12.24	-	-
JUNE	1730.88	633.86	(51.67)	81.79	453.25	170.55	150.66	-	84.27	187.97	20.20	-
JULY	941.74	589.45	-	-	16.25	-	80.89	-	44.30	210.85	-	-
AUG	1124.88	597.26	-	50.46	256.90	-	94.49	-	24.72	82.80	18.25	-
SEPT	1541.90	635.99	-	28.20	12.65	-	-	-	117.24	716.92	-	30.90
OCT	1627.30	695.42	-	35.00	393.20	170.55	104.08	-	176.50	24.60	27.95	-
NOV	4163.66	1543.35	-	42.20	17.00	(33.21)	115.54	-	669.19	1712.21	-	97.38
DEC	3435.52	1296.64	-	68.07	417.45	170.55	79.06	281.03	11.26	1092.66	18.80	-
TOTAL	19261.64	9260.14	-	505.06	2588.61	652.79	907.21	281.03	364.75	4472.87	100.90	128.28

Brackets indicate credit.

* Sundry includes sludge haulage costs of \$1298.40



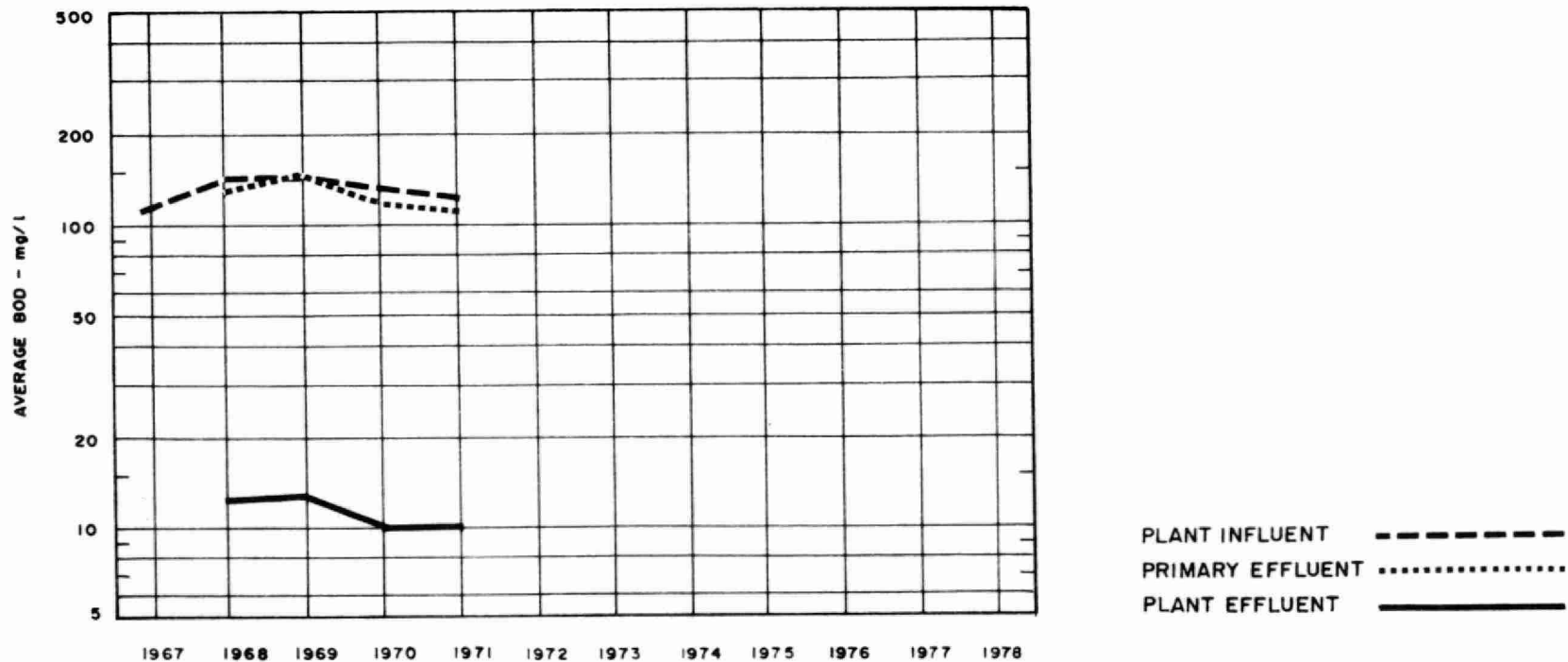
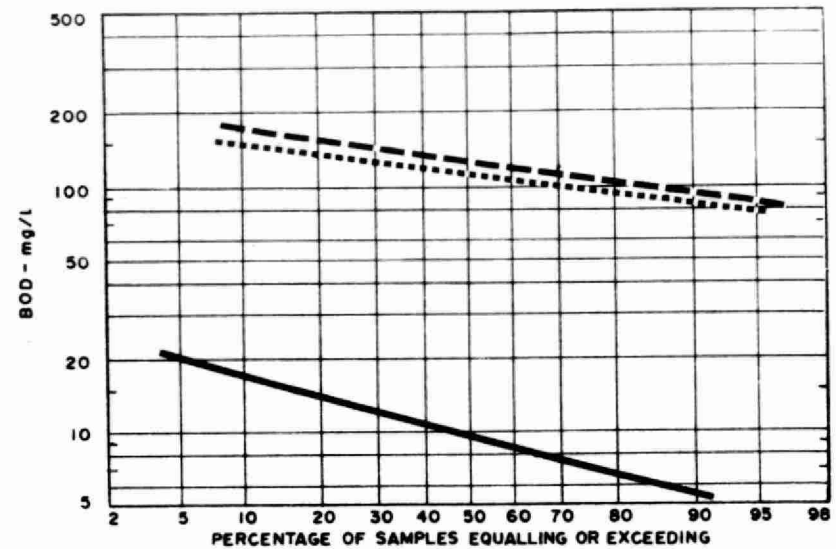
FLOWS



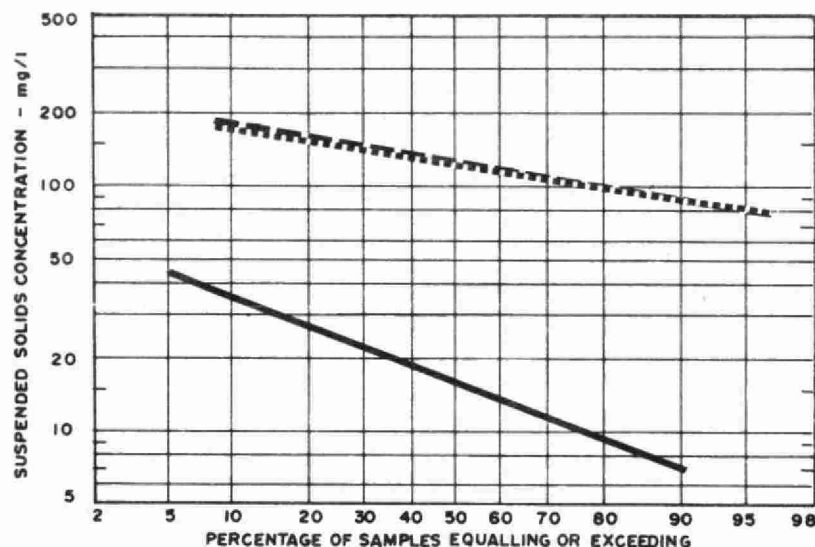
PLANT PERFORMANCE




MONTH	FLOWS				BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				TOTAL PHOSPHORUS		
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	MAXIMUM RATE	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDU
	million gallons	mil gal	mil gal	mgd	mg/l	mg/l	%	10 ³ pounds	mg/l	mg/l	%	10 ³ pounds	mg/l as P	mg/l as P	%
JAN	9.8	.32	.36	.52	175	12	93	15.9	115	15	87	9.8	8.4	3.5	96
FEB	8.6	.31	.48	.64	135	12	91	10.5	115	10	92	9.0	8.7	3.9	55
MAR	11.7	.38	.46	.65	118	13	89	12.3	125	20	84	12.3	9.4	3.2	66
APR	14.2	.47	.57	.65	92	14	85	11.1	98	28	71	10.0	4.1	1.8	56
MAY	10.9	.35	.46	.62	140	6	52	14.7	133	7	95	13.8	9.8	2.1	79
JUNE	11.5	.38	.38	.79	105	6	94	11.4	120	5	96	13.2	5.8	2.9	50
JULY	10.9	.35	.45	.65	160	16	90	15.7	125	23	82	11.1	9.8	1.8	81
AUG	11.8	.38	.44	.65	130	12	91	13.9	130	30	77	11.8	8.2	1.7	79
SEPT	9.8	.33	.38	.61	195	8	96	18.3	135	38	72	9.5	8.3	3.9	53
OCT	10.1	.32	.39	.63	120	6	95	11.5	85	8	91	7.8	8.3	3.3	60
NOV	12.4	.41	.51	.79	135	11	92	15.3	165	13	92	18.8	7.6	3.5	54
DEC	13.5	.44	.65	.78	100	11	89	12.0	130	10	92	16.2	6.2	2.5	60
TOTAL	135.2	-	-	-	-	-	-	162.6	-	-	-	143.3	-	-	-
AVG.	-	.37	MAXIMUM .65	MAXIMUM .79	135	10	93	13.6	123	17	86	11.9	8.1	3.0	63
No. of Samples	-	-	-	-	23	23	-	-	23	23	-	-	23	23	-

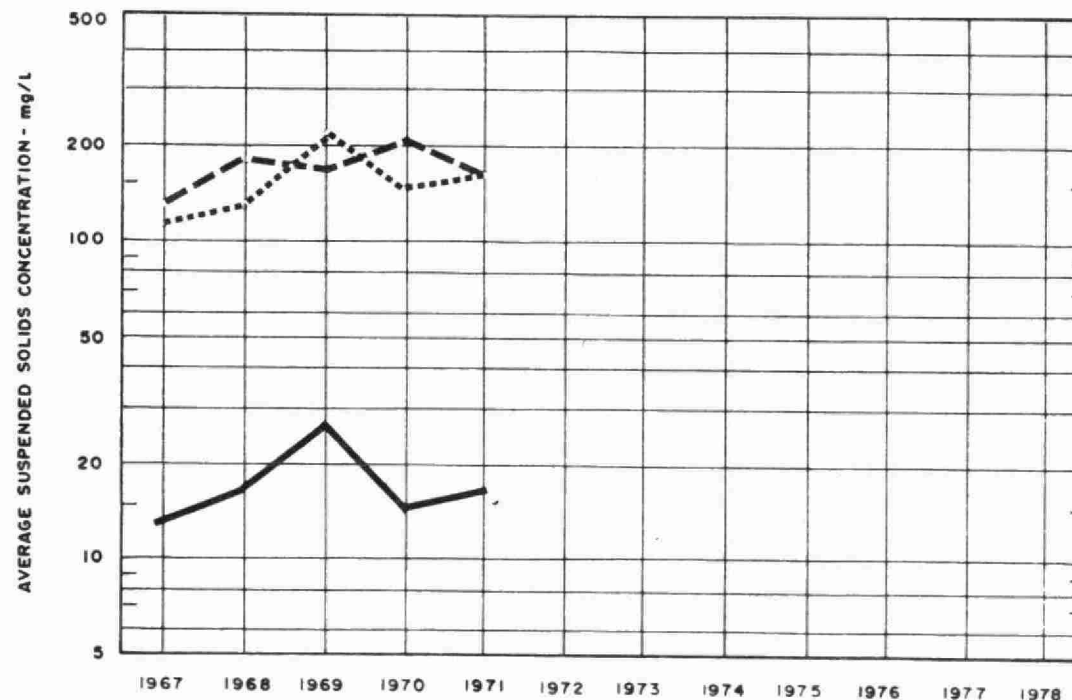
BIOCHEMICAL OXYGEN DEMAND



SUSPENDED SOLIDS



PLANT INFLUENT 
 PRIMARY EFFLUENT 
 PLANT EFFLUENT 

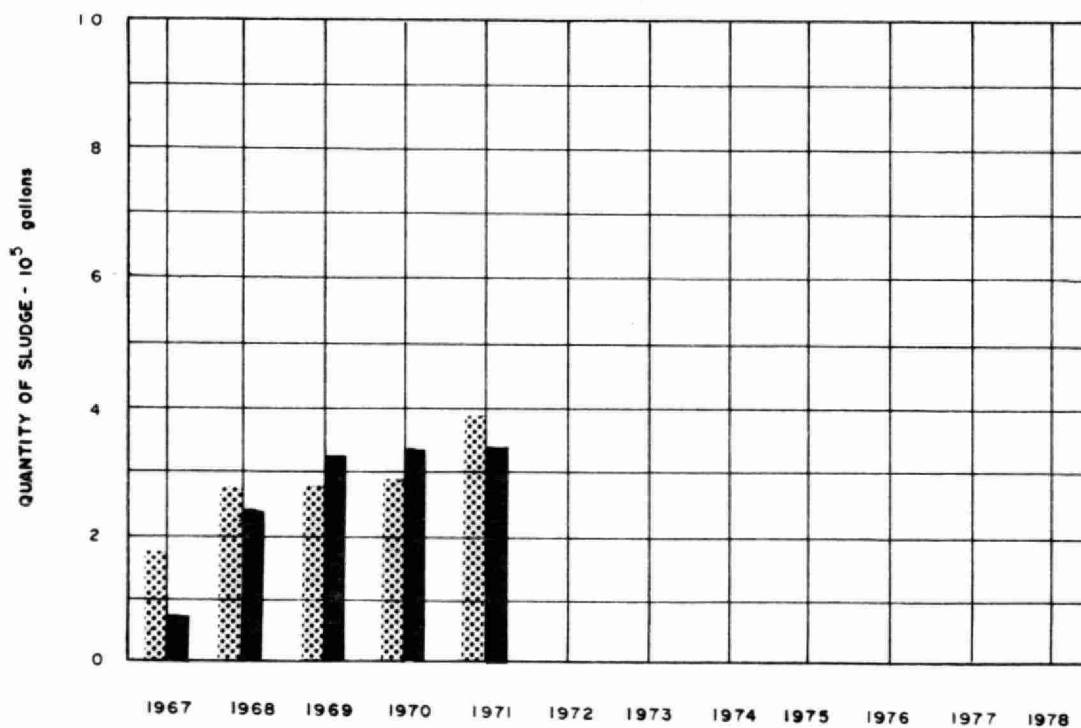
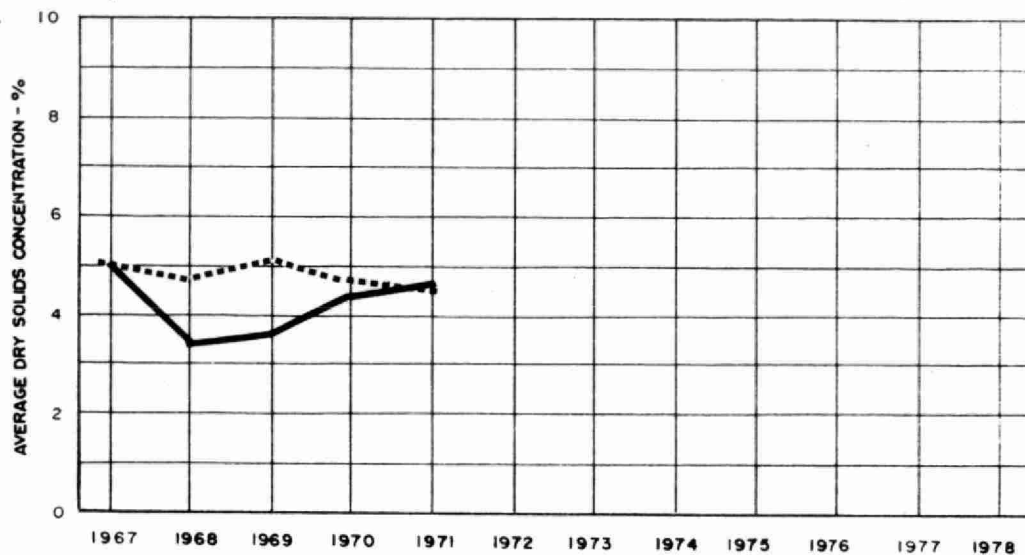


TREATMENT DATA

MONTH	GRIT	CHLORINATION		PRIMARY EFFLUENT		AERATION			SLUDGE DIGESTION and DISPOSAL							
	QUANTITY REMOVED cubic feet	CL ₂ USED 10 ³ pounds	AVG. DOSE mg/l	BOD mg/l	SUSPENDED SOLIDS mg/l	MLSS CONC mg/l	F/M day ⁻¹	AIR 1000 ft ³ lb BOD	RAW SLUDGE			DIGESTED SLUDGE			SUPER- NATANT T. S. %	AMOUNT HAULED cubic yards
									QUANTITY 10 ³ gallons	TOTAL SOLIDS %	VOL. SOLIDS %	QUANTITY 10 ³ gallons	TOTAL SOLIDS %	VOL. SOLIDS %		
JAN	6	.32	3.3	120	123	540	.8	-	24	3.8	59	14.	3.3	44	1.3	84
FEB	3	.32	3.8	130	125	620	.7	-	26	4.4	71	22	2.4	53	-	132
MAR	15	.41	3.5	127	160	910	.4	-	36	4.2	70	14	2.4	53	4.9	84
APR	38	.45	3.2	83	145	1050	.4	-	27	6.6	37	13	6.2	34	1.6	78
MAY	28	.29	2.7	116	143	1000	.5	-	28	5.6	56	16	7.4	36	.3	96
JUNE	65	.29	2.5	95	120	900	.5	-	38	5.5	56	38	2.9	39	1.1	222
JULY	50	.36	3.4	130	100	1340	.4	-	29	4.7	50	37	4.2	-	.2	222
AUG	69	.55	4.6	70	100	1260	.2	-	30	3.6	53	35	10.2	23	.2	210
SEPT	53	.42	4.3	90	75	1280	.3	-	33	4.9	62	31	4.4	41	.1	186
OCT	30	.42	4.1	115	90	670	.6	-	41	3.8	65	44	3.7	56	.1	258
NOV	20	.38	3.1	120	110	760	.7	-	46	3.8	66	39	3.9	46	.1	234
DEC	53	.32	2.3	130	180	990	.6	-	41	3.6	67	34	4.4	37	.1	204
TOTAL	430	4.53	-	-	-	-	-	-	399	-	-	337	-	-	-	2010
AVG.	3.2 cu. ft/mil gal	.37	3.4	110	123	940	.5	-	33	4.5	59	28	4.6	42	.9	167

DIGESTION

RAW SLUDGE
DIGESTED SLUDGE ———



RAW SLUDGE TO DIGESTER ▨
DIGESTED SLUDGE REMOVED ■

LABORATORY LIBRARY



96936000119456

Date Loaned

TD227/H86/W38/1971/MOE
Ontario Water Resources Co
Huntsville water
pollution control plant: atfd
1971 operating c.1 a aa
summary



Environment Ontario

Laboratory Library
125 Resources Rd.
Etobicoke, Ontario M9P 3V6
Canada